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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/725,251	11/29/2000	Seiichiro Mizuno	046124-5051	8246

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MORGAN LEWIS & BOCKIUS LLP
1111 PENNSYLVANIA AVENUE NW
WASHINGTON, DC 20004

EXAMINER

HIENN, TIMOTHY J

ART UNIT	PAPER NUMBER
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2612

DATE MAILED: 12/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/725,251

Applicant(s)

MIZUNO ET AL.

Examiner

Timothy J Henn

Art Unit

2612

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 November 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 8/2/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Terminal Disclaimer

1. The terminal disclaimer filed on 02 August 2004 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of Patent No. 6,201,573 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Response to Arguments

2. Applicant's arguments with respect to claims 1-4 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over McDaniel et al. (US 4,996,413) in view of the English translation of Mizuno (JP 09-051476 A).

[claim 1]

Regarding claim 1, McDaniel discloses a solid state imaging device (Figure 2) having: a photodetector (Figure 2, Items 40) including a photoelectric conversion device

Art Unit: 2612

(Figure 2, Items 42) for converting an incident optical signal into a current signal and a switch (Figure 2, Items 44) for outputting said current signal to an output terminal (Figure 2, Items 48¹ - 48^m); an integrator circuit for inputting and integrating the current signal outputted from the output terminal of said photodetector so as to output a voltage signal to an output terminal thereof (Figure 4, Items 56) and a signal processing unit for processing the voltage signal from the integrator circuit (Figure 4, Items 58). However, the signal processing unit of McDaniel does not include a variable capacity integrator, a comparator or a capacity control section as claimed.

Mizuno discloses a system for converting an analog signal to a digital signal (Paragraph 0051) for use in solid state imaging devices which includes a variable capacity integrator circuit (Figure 1, Items 220) having an amplifier for inputting to an input terminal a voltage signal (Figure 1, Items 221), a variable capacity part disposed between the input and output terminals of said amplifier, having a variable capacity value (Figure 1, Items 222; Figure 2), and a reset switch disposed between the input and output terminals of said amplifier (Figure 1, Items 223) and outputting an integrated signal; a comparator for inputting the integrated signal outputted from said variable capacity integrator circuit (Figure 1, Items 230), comparing the value of said integrated signal with a reference value (Figure 1, V_{REF}) and outputting a comparison result signal; and a capacity control section for inputting the comparison result signal outputted from said comparator (Figure 1, Items 240), controlling the capacity value of said variable capacity part according to said comparison result signal (Figure 1, "C"; Paragraph 0051), and outputting a first digital signal corresponding to the capacity value of said

Art Unit: 2612

variable capacity part when it is determined according to said comparison result signal that the value of the integrated signal and said reference value coincide with each other at a predetermined resolution (Figure 1, Item D1; Paragraph 0051). Mizuno discloses that this system allows production of images with a high SN ratio (Paragraphs 0015, 0100). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the A/D converters of McDaniel with the system of Mizuno to produce images with a high SN ratio.

[claim 2]

Regarding claim 2, Mizuno discloses a signal processing unit comprising a readout section for inputting the first digital signal outputted from said capacity control section and outputting a second digital signal corresponding to said first digital signal (Figure 1, Item 250).

[claim 3]

Regarding claim 3, McDaniel in view of Mizuno discloses a solid-state imaging device wherein said photodetectors are arranged in a first direction (McDaniel, Figure 2, Columns 1, 2, 3, m), while respective output terminals of the switches thereof (McDaniel, Figure 2, Items 44) are connected to each other so as to form a vertical photo detective section with a common signal output terminal (McDaniel, Figure 2, Items 48⁻¹, 48⁻², 48⁻³, 48^{-m}), M1 sets of vertical photo detective sections being arranged in a second direction so as to constitute a photoconductive unit (McDaniel, Figure 2); said solid-state imaging device further comprising: M2 sets of said integrator circuits (McDaniel, Figure 4, Items 56) where $M2 \leq M1$ (McDaniel, c. 7, ll. 14-25); M3 sets of said

Art Unit: 2612

signal processing units (Mizuno, Figure 1; McDaniel, Figure 4, Items 58) where $M3 \leq M2$ and $M3 < M1$ (McDaniel, Figure 2).

[claim 4]

Regarding claim 4, McDaniel discloses disposing signal processing units disposed in a side portion on an end side of said photo detective unit parallel to the first direction (Figures 2 and 4).

Conclusion

5. Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on 02 August 2004 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609(B)(2)(i). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.


Art Unit: 2612

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy J Henn whose telephone number is (703) 305-8327. The examiner can normally be reached on M-F 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy R Garber can be reached on (703) 305-4929. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TJH
12/13/2004


AUNG MOE
PRIMARY EXAMINER